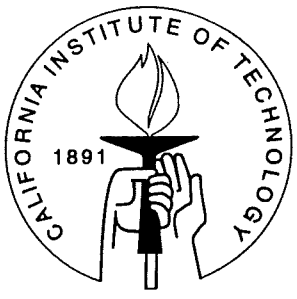
DIVISION OF THE HUMANITIES AND SOCIAL SCIENCES
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CALIFORNIA 91125

ATTITUDES, UNCERTAINTY AND SURVEY RESPONSES

R. Michael Alvarez

Charles H. Franklin
University of Wisconsin-Madison



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Attitudes, Uncertainty and Survey Responses*

R. Michael Alvarez Charles H. Franklin

Abstract

Theory: We assume that survey respondents are uncertain about their attitudes, and that their attitudes about political issues can be understood as probability distributions. From this perspective, we derive the "expected value" survey response model. We also derive a dynamic model of attitude change, based on the notion that attitudes are uncertain.

Hypotheses: This perspective on political attitudes leads to two predictions. The first is that uncertain respondents will show less variance in responses than certain respondents, and that the less certain will tend to give responses towards the midpoint of issue placement scales. The second is that uncertain respondents will have less stable opinions about political issues over time.

Methods: These hypotheses are tested using new survey questions we have developed to measure respondent uncertainty. These survey questions have been included in three recent national surveys, two conducted by the Letters and Sciences Survey Center at the University of Wisconsin, Madison and the other by the National Election Studies.

Results: We demonstrate that uncertain respondents are more likely that certain respondents to provide issue placements at the midpoint of the scale, controlling for many factors. Also, we show that uncertain respondents have less stable political attitudes than certain respondents.

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1 Introduction

Since Converse (1964) raised the disturbing possibility that many respondents answer survey questions by flipping mental coins, the nature of the survey response has been a central problem for the field of public opinion research. How attitudes are translated into survey responses is the most fundamental and complex issue of survey measurement. This question embraces a wide range of substantive and methodological debates, including such subjects as nonattitudes, measurement error models, response effects driven by order, framing and response alternatives, and the very conception of "attitudes".

The "non-attitudes" debate begun by Converse is particularly apt (even if well-worn) for our concerns because it simultaneously embraces models of both respondent attitudes and of the survey response. Converse's argument is that some substantial proportion of respondents (varying in size across issues) lack attitudes or opinions about particular subjects. When called upon to translate these (non-) attitudes into survey responses, they pick response options randomly. In Converse's view, the "randomness is in the respondents" who lack attitudes to report (Converse and Markus, 1979).

A major branch of criticism of Converse's argument takes a measurement error view of the survey response, recognizing that even if respondents had perfectly formed opinions, the inherent errors in translating these opinions into survey responses will mask the underlying stability of attitudes. In this view, the "randomness is in the measures". The debate over these alternatives has been long running indeed (Achen 1975; Bennett 1973; Erikson 1978, 1979; Feldman 1989; Nie, Verba and Petrocik 1976; Jackson, 1983; Page and Shapiro 1992; Pomper 1972; Smith 1989; Zaller 1992). As Achen (1983) points out, the statistical assumptions of measurement error models largely determine the substantive results. Sadly, these assumptions are fundamentally untestable in standard models.

For our present purposes, this debate illustrates the intimate connection between the theory of attitudes and the theory of the survey response. That this debate has not been resolved after so many years of work is substantially due to the observational equivalence of the non-attitudes and measurement error theories (Brady, 1993; Jackson, 1996). More recent work has attempted to reconceptualize both the nature of attitudes and of the survey response in order to escape the deadlock of the non-attitudes debate (Zaller and Feldman, 1992). Such alternative models of attitudes have implications for survey response effects, and it is the integration of these — the models of attitudes, of survey response, and of response effects — which is of interest to us here.

The large body of work on survey response effects has shown that differences in the wording of questions, in the order in which questions are asked, in provision of middle response options, in the framing of questions, and more, have systematic effects on the responses given by individuals (Bishop, Oldendick and Tuchfarber 1978; Zaller and Feldman 1992; Schuman and Presser 1981; Krosnick and Berent 1993). All such effects are a surprise to a naive (and straw-man) theory of attitudes and survey response which posits that everyone has an attitude and that they simply report that preexisting attitude to the interviewer. Alternatively, a theory which views attitudes as often tenuously held

finds little surprise in data which show that question wording, or framing, or response options matter. Thus there is an intimate connection between theories of attitudes and theories of survey response effects, though this connection has often been lost by treating response effects as a purely methodological issue of questionnaire design.

In this paper we present a model of attitudes which takes account of uncertainty inherent in political (and other) beliefs, preferences and perceptions. We show that this model has implications for survey responses and that simple survey measures are consistent with these implications. The survey response effects we uncover have substantial impact on the marginal distributions of attitudinal measures and on survey response stability.

In the remainder of this paper, we briefly present a non-technical outline of our model of attitudes, then move on to a central prediction of the model — that uncertain respondents, despite greater variance in the model of attitudes, will actually exhibit *smaller* variance in their survey responses, and that there will be a pronounced survey response bias in favor of mid-points among the most uncertain. We trace out some of the consequences of these effects and conclude with a discussion of the implications for measurement and interpretation of survey responses.

2 A Brief Outline of the Theory

We begin by assuming that the political world is inherently uncertain. Candidates sometimes take ambiguous positions and more often attempt to avoid some issues entirely. To the extent that political preferences are based on expectations for the future, these expectations must include uncertainty over future events. Even when considering the current state of affairs, the inherent complexity of policy and its links to outcomes, the often high costs of information, and cognitive limitations, all guarantee that citizens will be uncertain to some degree in their evaluations of policy, candidates and their own preferences. Uncertainty is ubiquitous.

A substantial advantage of this assumption is that we can integrate Converse's fundamental point — that citizens do not always possess well formed attitudes on every subject a survey demands opinions about — into our model of attitudes while giving the non-attitudes thesis a formal representation. The more ill-formed an attitude is in our model, the more uncertain the respondent is of that response. At some point of maximum uncertainty, we have non-attitudes. At the opposite extreme, we have highly crystallized attitudes, to use Converse's terms, corresponding to very low uncertainty. By allowing uncertainty to vary, we also avoid a dichotomy between attitudes and non-attitudes and recognize a continuum of clarity which may vary across respondents and across issues.

Given that uncertainty is a basic fact of the political world, it is surprising that relatively few researchers have attempted to incorporate citizen uncertainty into their theoretical and empirical work. The research we draw upon concerns how uncertainty

influences political perceptions (Alvarez 1996a; Alvarez and Franklin 1994; Bartels 1986; Franklin 1991a; Shepsle 1972). Here, attitudes are represented by probability distributions, with some location and scale parameters. In most representations, the scale parameter is simply the variance. The greater the variance, the greater a person's uncertainty. This perspective has provided some fruitful insights into the process of political campaigns (Alvarez 1996a; Shepsle 1972), candidate choice and evaluation (Alvarez 1996a; Bartels 1986; Franklin 1991a), and more generally, political perceptions (Alvarez and Franklin 1994; Franklin 1991b).

The problem with these models is that the variance in attitudes, and hence the uncertainty, is unobservable. Most of the empirical work has taken the variance as a parameter of the model to be estimated (e.g. Bartels 1986; Franklin 1991a, 1991b.) This approach has the virtue of producing statistical estimates of uncertainty, which can then be subject to the standard apparatus of statistical testing. The unfortunate side of this approach is that the parameterization depends on many assumptions, and the estimation may be seriously affected by model misspecification (Alvarez 1996a). In particular, Franklin (1991b) shows that model specification errors are likely to be confounded with the estimate of uncertainty.

An alternative approach is to develop survey measurements of uncertainty. This has the advantage of transforming a largely statistical problem into one of research design and measurement. Even imperfect indicators of uncertainty may provide better leverage in estimating statistical models than models which lack any such measures. Several studies (Alvarez 1996; Campbell 1983) make use of existing survey measures to develop an indicator of respondent uncertainty. Here we take the approach of designing a survey question specifically intended to measure respondent uncertainty. Our approach is both direct and simple: we ask the respondent how certain they are about their position on an issue, or about a candidate's position. In previous work (Alvarez and Franklin 1994) we have shown that this measure is distinct from general information or education, and that it varies substantially over individuals, issues and objects of evaluation (namely the self, incumbent U.S. Senators and non-incumbent Senate candidates.)

A natural way of thinking about uncertainty in this model is to imagine what happens as a respondent moves from very high certainty to complete uncertainty. At the most certain extreme, the probability distribution collapses on a single point, meaning that the respondent attaches probability 1.0 to that point and probability 0 to all other points along the dimension. As uncertainty increases, the distribution spreads out— there is now some non-zero probability that a range of points could represent the respondent's location, or their perception of the location of some object, such as a candidate. As uncertainty increases, the variance of this distribution increases as well, indicating a wider range of relatively likely locations. When the respondent is absolutely clueless, the probability distribution becomes a uniform distribution across the entire dimension. This substantively says that the respondent is unable to distinguish any possible location as more likely than any other. We argue that this is a natural interpretation, within our model, of Converse's concept of a non-attitude.[1]

Previous conceptualizations of this model have taken the underlying dimension to be continuous and unbounded, and have assumed simple distributions, typically the normal, which possess only location (mean) and scale (variance) parameters. In such models, the mean and variance are independent of one another, so it is possible to increase the variance without altering the mean. We take a different tack.

Because our empirical focus is concerned with finite ordinal survey items, such as issues measured along a seven point scale (a format common to both the National Election Study and the General Social Survey, and essentially the same for any finite ordinal survey scale), we want to consider what happens when respondents are forced to think of issues along a bounded range, rather than an open line.[2] This forces us to abandon the normal distribution, since it is inherently unbounded. A better alternative is available in any case.

The Beta distribution has several nice properties which make it attractive in our case. First, it is naturally bounded between a lower and upper limit. Second, the Beta can take a variety of shapes depending on the values of its two parameters, including symmetric, skewed, uniform and even bimodal (though we ignore the last). Finally, the shape, mean and variance of the Beta distribution depend on only two parameters, and so the distribution, while less familiar than the normal, is relatively simple. We believe that these attributes make the Beta distribution one which is more appropriate for the study of public opinion than the normal distribution.[3]

The most important consequence of assuming a bounded attitude dimension is that the mean and variance are no longer independent of one another. Because the tails of the distribution cannot extend past the bounds, when the variance gets sufficiently large (i.e. when the tails hit the bounds and thus force the accumulation of probability mass near the bounds) the mean is forced to move towards the midpoint of the distribution. As the probability distribution flattens out towards the uniform, the mean moves towards the midpoint, until for a uniform distribution the expected value is exactly the midpoint of the dimension.

When respondents are forced to give a point estimate for the location of some object (be it self or other), they must somehow reduce the probability distribution which represents their perception of possible locations, to a single point. If there is a loss function associated with errors in estimated location, then the optimal point estimate will depend on the loss function in the same way that the choice of median or mean depends on whether losses are based on the sum of absolute errors or of squared errors in statistical applications. For symmetric distributions, the mean and median coincide, so only the non-symmetric case presents problems. As a working hypothesis, we are willing to assume that large errors are more costly than linear losses would imply, and so something more like squared losses is an appropriate approximation of the loss function. If this is true, then the optimal point estimate is the expected value of the distribution. Given this fact, we call this model the "expected value" survey response model.[4] Even if this assumption is wrong, the expected value and the median will move in the same direction

as uncertainty increases, so our predictions about the survey response effects will be in the right direction in any case.

This model is in contrast to an alternative, plausible, model which we call the "random sampling" response model. In that alternative, the respondent does not calculate the expected value of her distribution of possible locations, but rather draws a single location from the distribution. The random sampling model is similar to Zaller and Feldman's (1992) proposed model of the survey response. In their model, respondents sample from possibly relevant considerations when constructing answers to survey questions. The notion of a distribution of possible considerations, and a small sample from this set, is rather close to our notion of a random sampling response model, except that we impose more restrictions on the form of the probability distribution than Zaller and Feldman impose on the set of possible considerations. It would appear that their less restrictive conception would predict even more variation in responses than would our random sampling notion.

These two models give strikingly different survey response predictions. Under the random sampling model, greater uncertainty should be accompanied by increasing variance of observed responses. In contrast, the expected value model predicts that there is decreasing variance in responses as uncertainty increases because the expected value of the underlying distribution is forced towards the midpoint of the dimension as uncertainty rises. Thus the most uncertain respondents will be forced to have similar expected values. Paradoxically, among the more certain respondents, there is more room for variation in expected values (and hence in observed responses) because small variances imply relatively less constraints on expected values, which allows individual differences in beliefs across respondents to appear in the means of each respondent's underlying distribution.

This is our core prediction for survey response effects. Our expected value model predicts that uncertain respondents will show less variance in responses than will respondents who are more certain, and the less certain will show a pronounced preference for responses towards the midpoint of the seven-point scales we use while the more certain respondents will vary in their responses but will be less attracted by the middle of the scale.

Our survey response model also provides considerable insights into a second important problem in the public opinion literature. By beginning with an assumption that attitudes about political issues can be represented by probability distributions, we show below that one of the central dilemmas in the public opinion literature — the debate over the temporal stability of individual attitudes (Converse 1964; Achen 1975, 1983; Erikson 1979; Feldman 1989) — has a simple resolution. Individuals with more certain attitudes (those with lower variance) do have very stable attitudes, while those with uncertain attitudes have very unstable attitudes. We test both these predictions in the next sections of this paper.

3 Methods and Data Sources

To test the propositions we advance in the remainder of this paper we turn to three survey data sources. The first two were national telephone surveys conducted for us by the Letters and Science Survey Center of the University of Wisconsin, Madison. In the first survey, conducted in the fall of 1991 and winter of 1992, 797 adults from the 48 contiguous states were interviewed by telephone. The second survey was in the field in the fall of 1992, yielding a sample of 877 adults. Both samples are rolling cross-sections, with national probability samples being generated daily, yielding small samples of the national adult population. Both samples correspond quite closely to the population of American adults on important demographic dimensions, though as is common with telephone surveys the samples are a bit more highly educated than the country as a whole.[5] In the remainder of this paper we will abbreviate our references to these two surveys as LSSC 1 and LSSC 2 to denote the 1991-92 and fall 1992 studies, respectively.

These surveys were designed primarily to elicit information about the positions of the respondent on important dimensions of public policy and their perceptions of the positions of either the incumbent Senators or Senate candidates from their state. In addition to asking respondents to place themselves and the Senate incumbents or candidates on standard seven-point issue scales, we also asked respondents how certain they were about these placements. In the first survey, we asked respondents to place themselves and an incumbent Senator on three seven-point scales — abortion, tax increases, and ideology — while in the second survey we asked respondents for placements of themselves and their sitting Senators (in states without Senate races in 1992) or two Senate candidates on two seven-point scales — abortion and ideology. Because the LSSC 1 survey involved a split half experiment on the uncertainty question wording, we restrict most of our analysis of that study to the half sample which received the same uncertainty item as used in the LSSC 2 study (373 respondents). More specific details about both surveys are in the Appendix, including the exact wording of the uncertainty questions.

The third source of survey data we use is the National Election Study (NES) 1993 Pilot Study. This survey was a telephone reinterview of 750 persons originally interviewed in the 1992 NES pre- and post-election study. Most important, for our purposes, was the inclusion in the 1993 Pilot Study of the same uncertainty format questions following the liberal-conservative placements of the respondent, Clinton, Perot, and the respondent's House incumbent. More details of the NES Pilot Study are in the Appendix.

4 Uncertainty and the Survey Response

The primary prediction of the expected value response theory is that more uncertain respondents will show less variation in their responses and more affinity for the midpoint of our seven-point scales than will more certain respondents. This expectation is borne out in the data from all three surveys.

First, to give a clear representation of the differences we find in responses to the seven-point scales due to the respondent's uncertainty, we provide two figures. Figure 1 gives placements on the seven-point abortion scale broken down by uncertainty, for the respondent's own position (top panel) and their placement of their senator or senate candidate (bottom panel), from LSSC 2. Figure 2 provides placements from the 1993 Pilot Study, for the placements of their House incumbent and Clinton on the seven-point ideology scale by uncertainty. In both figures, the solid shaded areas give the percentages of uncertain responses at particular points on each seven-point scale; the clear areas give the percentages of somewhat certain respondents; and the hatched areas give the percentages of certain respondents.

Figures 1 and 2 go here

It is clear in Figure 1 that the uncertain respondents are clustered in the middle categories in both their reported placements of themselves and the senator or senate candidate on the abortion scale. In the top panel, the very high proportions of respondents who feel certain of their position on the abortion scale is quite striking. Almost 75% of the respondents said they were certain of their own position. However, there are clear trends in the distributions of certain and uncertain respondents, just as predicted by the "expected value" response model. Uncertain respondents are more likely to position themselves in the middle of the scale while certain respondents are very likely to position themselves more towards the extreme ends of this seven-point abortion scale. The χ^2 statistic (152.2, 12 d.f.), indicates that these distributions are statistically distinct.

In the bottom panel of Figure 1 is the same pattern. Uncertain respondents are very likely to place their senator or senate candidate in the middle of the seven-point abortion scale, as noted by the fact that 67% of those placing a senator or senate candidate at the midpoint position said they were uncertain about that placement. But only 4% of the placements at the midpoint are by people who were certain of their placement. Additionally, certain respondents are more likely to place these senators or senate candidates towards the extremes. And these distributions are statistically distinct, as measured by the χ^2 statistic (120.8, 12 d.f.).[6]

Figure 2 presents similar graphs, but for the placements of House incumbents and Clinton on a seven-point ideological scale, from the 1993 NES Pilot Study. In both panels of Figure 2 the same effects are clear. For House incumbents, overwhelming percentages of uncertain respondents placed the House member at the midpoint (69% of the placements at 4 on the ideological scale), or at the next two points on the scale (58% of 3's and 54% of 5's were respondents who were uncertain about their placements). The certain respondents were more likely to place their House incumbent at the endpoints of the scale, an effect which is statistically significant (χ^2=107, 12 d.f.).

In the bottom panel are the placements for Clinton on the ideology scale. Here, we still see the same general effect: the people placing Clinton at the midpoints of this ideology scale are uncertain about that placement, while those who placed him at the extremes

of the scale are certain about that placement. These patterns of Clinton placements, stratified by uncertainty, are also statistically distinct, with a χ^2 of 135 (12 d.f.).

Of course, these four relationships are not the only ones we have found in these three surveys. In fact the relationship predicted by the "expected value" response model can be found generally across the three surveys in which we have the uncertainty questions, across issues, and across political figures respondents are asked to place. We present all of the response marginals for all of the seven-point scales for which we have the uncertainty questions in Tables 1-3. In Table 1 we give the percentages placing themselves or the political figure at each position on the liberal-conservative scale by uncertainty of that placement for all three surveys. Table 2 gives similar percentages for abortion placements in the two LSSC surveys; and Table 3 gives the percentages for placements on a seven-point tax increase question which was in our LSSC 1 survey.

Tables 1, 2 and 3 go here

The first important point is that our prediction from the "expected value" model about the heterogeneity in issue scale placements induced by uncertainty shows up clearly across the three surveys, the many different political figures, and the different issue questions. It is clear that the effect is not isolated to particular issues or political figures. Secondly, the only placements in which we do not see strong tendencies by the uncertain respondents to gravitate toward the midpoint occurs when they place themselves on each scale. There is a slight tendency by uncertain respondents to give midpoint responses, as predicted, but as we show in Figure 1 and Tables 1-3 the effect is not strong. This is caused by the fact that few respondents claim to be uncertain about their placements on these issue scales (Alvarez and Franklin 1994).

Next, we wanted to insure that these are also statistically significant patterns across the different surveys and placement objects. In other words, we simply wanted to make sure that each of the distributions we observe in Tables 1-3 are statistically distinct. To answer this question, we calculated a number of χ^2 tests, which we present in Table 4. Here the χ^2 tests for the three surveys are grouped together, and the columns give the different seven-point scales.

Table 4 goes here

First, it is apparent that respondent uncertainty over their placements does influence the reported placement on the seven-point scale. Of the twenty χ^2 tests we report in Table 4, eighteen are statistically significant at the p=.05 level or better. This is a remarkable finding, since it stands in direct contrast to the results reported by Krosnick and Schuman (1988). Their study did not show any systematic and substantial influences of uncertainty upon the use of middle alternatives, while our evidence in Figures 1-2 and Tables 1-4, does show a large and consistent effect of uncertainty on seven-point issue scale placements.

Also, it is worth mention that the χ^2 results are stronger when we pose the uncertainty question with three response alternatives than with two response alternative, a question

experiment in our first study (LSSC 1). This is important first since it implies that the three choice format is eliciting more information about respondent uncertainty than the two choice format. Apparently the three choice format elicits differences which are masked when the two choice format is employed. But more importantly, these differences between the two formats may account for the null results in previous studies. For, their versions of uncertainty questions employed *two choice formats*, which we have found appear not to measure uncertainty as well as the *three choice measures*. Indeed, notice in Table 4 that of the six χ^2 tests using the two choice uncertainty question, four are very close to the critical χ^2 level for p=.05, 6 degrees of freedom (critical $\chi^2 = 12.6$), and one is below this level. These correspond to the marginal results in previous studies.

But what other explanations might account for these findings? The literature on response effects, while focusing on a different type of attitudinal question than the seven-point scales, has developed some reasons people might respond in this way to survey questions which include explicit modal categories. These accounts have focused on attitudinal intensity, importance, and uncertainty. Yet the results of this body of work have favored explanations involving intensity and attitudinal importance, but not uncertainty.

In a very thorough examination of the properties of the seven-point issue scales, Aldrich, Niemi, Rabinowitz and Rohde reported that "One of the major weaknesses with the current seven-point scale format appears to be the concentration of respondents in the middle, 4, response category. Several indicators suggest that this concentration is not only unnecessary, but also misleading (Aldrich et. al. 1982)." Yet Aldrich et. al. did not provide an adequate explanation for the concentration of respondents in the middle categories of the seven-point issue scales. The only mechanism which they asserted might cause this effect was that the format of the question may not provoke people to think much about their answers. Aldrich et. al. tested this assertion by comparing the standard seven-point scale responses to the responses from a branching format question and did find that the branching-format scale responses were less likely to be clustered around the midpoint of the scale.[7] But this was not well researched in this paper, and this finding has been virtually ignored in the literature on public opinion and voting behavior.

In a related line of research, there have been a number of studies about the effects of adding middle positions to otherwise dichotomous attitudinal alternatives. Three studies in particular are important for our work. First, it is now widely accepted that adding a middle alternative to forced-choice attitudinal questions greatly increases the proportions of respondents in that category, relative to the proportions volunteering middle responses (Shumann and Presser 1981). However, it is not as clear what distinguishes those choosing middle alternatives from the other respondents. Schuman and Presser (1981) found only weak support for intensity of attitude as the primary discriminating variable. Bolstering this claim, Krosnick and Schuman (1988) found that attitude intensity and importance of the attitude to the respondent seemed to influence whether a respondent chooses the middle alternative or not, with those holding less intense or important attitudes more likely to choose the middle alternatives. Additionally, Klopfer and Madden (1980) found that "ambivalence" about the subject, and not uncertain, neutral or nonspecific attitudes,

influenced whether respondents used the middle categories.

The explanation for these findings stems from work in the psychology literature which has shown that people with more intense or more important attitudes are likely to be more extreme in their beliefs. People who have intense and important attitudes about the subject, the argument goes, tend to think more about the subject, and more thought about the subject tends to polarize beliefs and attitudes (Borgida and Howard-Pitney 1983; Tesser 1978; Wood 1982). Thus, those with less intense and important attitudes think less about the subject and have more moderate beliefs.

We can test for these alternative explanations. First, we wanted to make sure that the relationships between uncertainty and seven-point scale placement remain after we put in place controls for general political information and education. This will allow us to determine that the effects we observe are not simply due to more poorly informed or more poorly educated respondents simply gravitating to the midpoints of the issue scales. Here we compute general association statistics which allow us to examine the relationship between a respondent's uncertainty about a particular placement and the placement itself, controlling for education and political information.[8] Our results are in Table 5.

Table 5 goes here

It is clear in Table 5 that the relationships between uncertainty and seven-point scale placements are not simply artifacts of either education nor political information. In fact, the results are remarkably consistent with those in Table 4. In the results involving the three-choice uncertainty questions, the association between uncertainty and placements is strong and statistically significant, for both the respondent's own placement and their placement of the various political figures. It appears that neither information nor education is playing a role in the relationship we have predicted and found in the three survey datasets. It is also interesting that in the results involving the two-choice uncertainty items we again find much weaker associations. Indeed one of the statistics is not significant. This tends to buttress our conclusion that the three-choice uncertainty item provides a better measure of respondent uncertainty.[9]

But there are other variables which might also account for these patterns. Other than general political information and education, it is possible that people who are more involved in politics, who pay more attention to the coverage of politics in the media, or who feel intense in their ideological attitudes, may be more extreme in their political beliefs (Krosnick and Schuman 1988). While we do not have survey questions in the two LSSC surveys to test these hypotheses, we do have questions in the 1993 NES Pilot Study which allow us to test these alternative explanations for the relationship between uncertainty and seven-point scale placement.

Our tests are reported in Table 6. There, as before, we compute general association statistics for the relationship between the respondent's response to a particular seven-point ideological placement and their reported uncertainty about that placement. But in

addition to controlling for the effects of political information and education, we control for each of the three other effects: first for political interest, second for interest and media attention, and last for interest, attention and attitude importance.[10]

Table 6 goes here

Our conclusions are unaffected by any of these other accounts. None of these other variables, once controlled for, influences the basic patterns we observed earlier. Thus, we believe that political information, education, political interest, media awareness, and attitudinal importance cannot account for the effects of respondent uncertainty upon their responses to the seven-point scales.

5 Uncertainty and Attitudinal Change

The second anomaly which this conceptualization of political attitudes can help resolve is the debate over the temporal instability of respondent perceptions. By beginning with the assumption that attitudes about political issues can be represented by a probability distribution, with a central tendency and a variance, we easily open the door for a different perspective on the process of attitudinal change.

So, return to our second example above, where we assumed the respondent was absolutely uncertain about the particular issue. This person's perceptions can be summarized by a uniform distribution which is "flat" across the issue space. We might think about this individual as having no or very little prior knowledge about the issue. What happens if this respondent obtains some information about the issue? That information will form the basis of the respondent's new perception about the issue. Then, if at some future date more information is obtained, this might also be taken into account in the respondent's perception, in the form of some weighted average.

One way to formalize such a model of attitude change is taken from the bayesian approach to political learning (Achen 1992; Alvarez 1996a; Bartels 1993; Calvert and MacKuen 1985; Franklin 1991b; Zechman 1978). In this framework, attitudes are represented mathematically as a weighted function of past beliefs and new information, with the weights expressing the person's uncertainty. So, if a person is very uncertain about their past beliefs their attitudes are very susceptible to new information. On the other hand, if a person is quite certain about their past beliefs, new information and the passage of time is very unlikely to lead them to change those beliefs.[11]

We formalize this model of attitude change with the following notation:

$$A_t = \frac{\mu_{t-1} A_{t-1} + \mu_t^I I_t}{\mu_{t-1} + \mu_t^I} \tag{1}$$

$$\mu_t = \mu_{t-1} + \mu_t^I \tag{2}$$

where A_t stands for a person's attitude at time t, μ_t stands for their certainty about that attitude, I_t stands for some new information, and μ_t^I the certainty about that information.[12] If a person's prior beliefs are very certain (μ_{t-1} is large), then the new information, no matter how certain, will have little influence in changing the person's attitude (which we would measure as A_T). However, were their prior beliefs very uncertain (μ_{t-1} is very small), then new information has a very large effect, and we would measure a very large deviation between the new and old attitude. This large deviation we would call attitude change.

So, thinking about political perceptions in this framework, we can shed considerable light on a second empirical puzzle in the public opinion literature. The common assumption in this literature has been that people should possess temporally stable attitudes; when asked repeatedly about their positions on issues in the course of a panel study, for example, the common expectation has been that an individual should give the same position. There has been a long line of research dating back to the work of Converse (1964) on the temporal stability of political attitudes (Achen 1975, 1983; Erikson 1979; Feldman 1989).

The learning model gives us reason to question this assumption that all individuals should have stable positions on political issues, and in so doing, leads to our second set of empirical predictions. In fact, the model predicts that only one set of respondents in a panel study should have stable positions — those who are quite certain about their positions. On the other hand, a simple bayesian model of attitude change predicts that those who are very uncertain about their positions should show considerable instability in their reported positions between waves of a survey panel. As they obtain new information, their beliefs can change quite dramatically.[13]

We take advantage of the 1993 NES Panel Study to test whether people with more certain attitudes have more temporally stable attitudes. We do this by first computing the correlation between each respondent's placement of themselves, Clinton and Perot on the seven-point ideology scales in 1992 and 1993. Then, we compute these same correlations again, stratifying respondents by the amount of uncertainty they express about their placements. The Kendall τ-b correlation coefficients are given in Table 7.

Table 7 goes here

The first column gives the correlations between the two placements for the entire sample, and the next three columns give the correlations by respondent uncertainty. First, notice that between these two interview periods, the stability of respondent ideological placements is relatively high (correlation of .590). However, this drops considerably for both of the political figures they were asked to place — Clinton (.359) and Perot (.208). Looking only at these correlations, the level of temporal stability in respondent ideological attitudes does not seem very great.

But in the next three columns there is a lot of heterogeneity in these correlations, just as predicted by the model of learning we discussed earlier. Here, the temporal stability

of the placements of the very certain respondents is somewhat higher than for the overall sample. The stability of respondent ideological placements is slightly *greater* than the entire sample (increasing from .590 to .613). But the stability of placements for the uncertain respondents is quite low. Notice that the stability of the uncertain respondent's own placement is almost half of that for the certain respondents (an estimated correlation of .381).

The heterogeneity we observe for the two political objects (Clinton and Perot) in the 1993 NES Pilot Study data is even greater. Beginning with Clinton, the over-time stability for the certain respondents is somewhat higher than for the entire sample (.520 for the certain respondents compared to .359 for the entire sample). But the stability for the uncertain respondents is very slight, with a correlation of .147, which is more than seventy percent lower than the certain respondents. For Perot, the patterns are identical. The only major difference in the Perot placements is that the overall levels of stability are much lower.

As before, there are other explanations we need to control for before we can rely upon these findings. The important alternative explanations focus on information and education, on interest and exposure, and on attitude importance (Zaller 1992; Krosnick 1988; Krosnick and Schuman 1988). We compute Kendall partial τ-b correlations to control for each of these alternative accounts, and these correlations are presented in Table 8.[14]

Table 8 goes here

In Table 8 we report each set of partial correlations independently. What clearly stands out in this table is that none of these control variables mitigates the patterns of correlations we observed earlier. In each instance, the temporal stability of ideological placements for the very certain respondents is quite high, while that for the uncertain respondents is quite low. These controls allow us to be quite confident that the predictions of our model of learning and attitude change — that those with more certain attitudes should be more resistant to attitude change that those with uncertain attitudes — are supported by the data in the 1993 NES Pilot Study. Additionally, we know now that there is a great deal of heterogeneity in temporal stability of seven-point scale placements, and that this heterogeneity may have hindered previous attempts to determine the extent of attitudinal stability in American public opinion.

6 Discussion

These findings provide new insight into some old and perplexing problems in the literature on American public opinion. First, and most generally, our hope is that researchers begin to explore the areas between the predominant assumptions about attitudes which have fueled most of earlier work; instead of assuming that citizens either have perfectly formed attitudes or that they have no attitudes at all, the assumption should be that people

have uncertain attitudes. This should open the door to a new perspective on political attitudes, where we recognize that the "black and white" model, for one example, does not describe the reality of American public opinion. Instead, attitudes can be arrayed on a continua, with one end being well-formed and consistent, the other being ill-formed and inconsistent, with the middle representing varying degrees of formation and consistency. By recognizing the variability in certainty, across both individuals and measurements, more realistic models of attitude formation and change can be constructed.

Second, our work should open new debate into the process of attitude formation and change. Working within a simple description of political attitudes and learning, we generated the implication that we should see change mainly in the attitudes and perceptions of people who are most uncertain about those attitudes. The empirical results from the 1993 NES Pilot Study clearly supported this model.

This has a number of implications. One is that some of the prominent papers which have argued that attitudinal instability is due to poor survey measurement are called into question. For example, a common approach has been to regress some estimate of measurement error in an attitude upon respondent demographics and general measures of political interest (Achen 1975; Erikson 1978). This produces little evidence that measurement error varies with individual characteristics. Our results suggest that entering respondent uncertainty into such a regression would change the conclusion.

We have shown that our measures of respondent uncertainty divide respondents into groups with stable and unstable attitudes. If our findings are correct, then it is not appropriate to pin all of the blame on bad survey questions. Imperfect survey measurement may be part of the problem, but we believe that a large part of the answer lies in the certainty of the attitude to the respondent. As Converse (1979) put it, there is randomness in the respondents, not just the questions. Our results show that the source and nature of the randomness in respondents can be directly examined and used to generate new hypotheses about public opinion.

Another implication concerns models of attitudinal change. One model which has received a great deal of attention recently has been the redevelopment of the "response-acceptance" model of attitude change (Converse 1962; Zaller 1989, 1992). The major implication of this model of attitude change is that learning and attitude change primarily occurs for the moderately aware and moderately exposed citizens; not for those who are poorly aware and exposed or well aware and exposed.

Our model of attitude change makes a different prediction for which portions of the American populace have the most possibility of learning. The bayesian model we posited above predicts that those who are the least certain about their attitude on an issue will be the most likely to change their attitude in the face of new information. And we find in the data strong support for this prediction. The bayesian model has been little tested due to the difficulty of measuring respondent uncertainty. We believe our measure is a start in solving this problem. The differences between the Converse-Zaller and the bayesian models of attitude change need more exploration, some of which can now be done using

our measure.

Last, our model has interesting implications for scholarly understandings of the nature of the survey response. We have posited a different model of how people answer survey questions, and we have found strong support for some of the direct hypotheses derived from this model. Rather than beginning with the assumption that people do not have attitudes (Zaller and Feldman 1992), our model is predicated on the assumption that people have uncertain attitudes. The survey response in our view is a reflection of a citizen's underlying attitude, but it is a reflection only to the extent that it indicates the central tendency of the distribution of a person's beliefs about a particular issue. The uncertainty in these positions indicates the spread of the distribution of opinion. Rather than assemblying attitudes from discrete pieces of opinion, as in Zaller and Feldman, our model implies that citizens both have attitudes and know that they are not always certain about those attitudes. There is both a central tendency and a spread in our model of public attitudes.

Our results on the uncertainty-induced heterogeneity in seven-point scale responses should be grounds for some discussion. In previous work (Alvarez and Frankin, 1994) we found that the impact of attitudes varies with respondent certainty. Our results here show that uncertainty also has substantial effects on the marginal distribution of measured attitudes. These findings argue that uncertainty produces heterogentity in public opinion and that the effects of that uncertainty on political attitudes are substantial. Normal practice in political science has ignored this heterogeneity. We believe our measures of uncertainty not only point out the problem, but also offer the potential to develop statistical models which incorporate these effects.

The expected value response theory also has an unfortunate characteristic. If respondents behave as predicted by this model, then their observed responses tell us only about their expected values, and nothing at all about the variance (and hence uncertainty) of their attitudes. This is not a failure of the model, but rather a logical consequence of the behavior. Nature refuses to identify the uncertainty parameter for us under this model. In such a circumstance, it will be impossible to resort to statistical estimation of uncertainty, because the parameter is observationally under identified. This provides even greater incentive for us to attempt direct, even if crude, measures of subjective uncertainty, rather than rely on statistical estimation.

Thus, for a fuller understanding of a citizen attitudes about political issues, we need to explore the other component of their attitudes— their uncertainty. This component of attitudes has only recently begun to be examined in the public opinion and elections literature (Alvarez 1996a; Alvarez and Franklin 1994; Bartels 1986; Franklin 1991). We have shown that attitude uncertainty can be measured in a survey format, and that it provides new perspectives on some of the lasting puzzles in the literature. Much more work on the implications of attitude uncertainty remains to be done.

7 Endnotes

1. Note that non-attitudes are represented by the uniform distribution, but this is not the same as maximizing the variance of the distribution. There are other high-variance attitudinal distributions: in fact, the variance is maximized if we put half the probability at one end of a bounded dimension, and the other half at the opposite end. This does not seem a plausible scenario, though, when thinking about political attitudes. In the case of issue positions, for example, this would mean that an individual places high probability that a candidate is at *both extremes* on a particular issue, a situation we do not believe likely or interesting. Our point is simply that in most plausible political situations, maximally uncertain individuals will have attitudes which are essentially flat across the issue space.

2. We continue to think of this range as continuous, even though the survey instrument is discrete. The translation of continuous, though bounded, attitudes into discrete, ordinal, survey measures is captured in our measurement model, rather than here in the attitudinal model.

3. For an accessible discussion of the Beta, see Evans, Hastings and Peacock, 1993.

4. Even if this assumption is incorrect, our primary interest is in the case of high uncertainty, represented in the limit by the uniform distribution which is inherently symmetric.

5. For example, in 1991 the Bureau of the Census reported that 48.7% of adults were male and 51.3% were female. In our first survey, the sample proportions by gender were 45.8% male and 54.2% female; in the second survey, the proportions were 48.9% male and 51.1% female. The Census also reported that 84.2% of the population was white and 12.4% black. In our first survey we interviewed 87.8% whites and 7.7% blacks, while in the second survey we interviewed 87.9% whites and 7.9% blacks. On other demographic dimensions, like age, and geographic distributions, both samples closely match the American population.

6. The differences between respondent and senator or senate candidate placements are discussed in Alvarez and Franklin (1994). There is no grounds for objecting to the presentation in the bottom panel of Figure 1 on the basis that these percentages are aggregations across sitting Senators, incumbent Senators running for reelection, challengers to these incumbents, and Senate candidates in open seat races. For the patterns in Figure 1 are identical when we break the data down for different types of senators and senate candidates, although the sample sizes become quite small. For incumbents facing reelection, for example, 68% of those placing the incumbent at the

midpoint on the abortion scale were uncertain about this placement, and 51% of those placing the incumbent at 4 on the ideology scale were uncertain as well. 36% of those placing the incumbent at 1 or 7 on the abortion scale were certain of that placement, and 31% of those placing the incumbent at either extreme on the ideological scale were certain of that placement. For challengers to these incumbents, the patterns are almost identical. 63% of those placing the challenger at 4 on the abortion scale, and 64% of those placing the challenger at 4 on the ideological scale, were uncertain of these placements. And from 27% to 37% of respondents placing the challengers at either extreme on either scale were certain of these placements. Therefore, these findings in Figure 1 are not artifacts of aggregating different types of incumbents and challengers into one set of percentages.

7. The relationship between uncertainty and issue attitude is not an artifact of the seven-point scales. The same relationship exists in branching-format issue and candidate trait scales (Alvarez 1996b), which is beyond the scope of this paper.

8. We use Cochran-Mantel-Haenszel general association statistics. They can be thought of as χ^2 statistics adjusted for the presence of other variables. We code the independent variables so that correspond as closely as possible across each survey. In the case of our variables for political information and education, both are coded as binary indicators, with high political information being coded 1 and low coded as 0. In the LSSC and NES Pilot surveys, we simply created a political information score taken from all available factual political information questions, and we recode this into the binary indicator. For education, we simply code people with a high school education or less as 0 and those with more than a high school education as 1. The questions we use for the NES Pilot Study tests come from the 1992 wave of the panel.

9. Additional discussion of the superiority of the three choice uncertainty probe over the two choice uncertainty probe is in Alvarez and Franklin (1994).

10. The political information and education measures are coded as before. Political interest and media attention are coded from questions asking how much interest the respondent had in the 92 election and how much media they reported regular access to during 1992. The ideological attitude importance item was coded from a series of open-ended responses to a question concerning the respondent's understanding of what the labels liberal and conservative meant; the operative assumption underlying this measure is the more important ideology was to a respondent, the more open-ended responses to these questions they would report. As before, all these measures were coded into binary measures, and all came from the 1992 wave of the panel study.

11. Models of learning and attitudinal change similar to this perspective can be found in the literature. One type of formalization can be found in the psychology literature, in the form of "information integration theory" (e.g. Anderson 1971). In these models, people's attitudes are a weighted function of prior beliefs and new information, where the weights represent how salient the new information is to the person.

12. This specific mathematical formulation of our model of attitude change is based upon the assumption that the individual's attitudes are normally distributed, which is only one specific case of our general model of attitudes in the previous section. Given our general assumption about the distribution of individual attitudes, this corresponds to cases where individuals have symmetric, but bounded, distributions of beliefs about issues in the previous section.

13. Alternatively, the most uncertain could be seen as having very little variation in their expected value responses except that due to stochastic measurement. If all have expected values of about 4 on our measures, then all response variance is "error" variance. So long as these errors are uncorrelated, we will find low temporal stability. The more certain respondents, in contrast, vary in their perceptions and so their responses based on the expected value model contain both individual variance and measurement variance. The individual variance will show more temporal stability, as we argue. A test of whether instability is due to Bayesian learning or due to simple measurement error is beyond the scope of this paper. In either case, our conceptualization of the survey response is unaffected.

14. The variables here are all coded as in the previous tests.

8 Appendix

8.1 LSSC 1

The LSSC 1 data we analyze come from a national telephone survey conducted in the fall of 1991 and winter of 1992 by professional interviewers at the Letters and Science Survey Center (LSSC) of the University of Wisconsin, Madison. A national probability sample of 797 adults from the 48 contiguous states were interviewed. Multiple callbacks were attempted in order to secure an interview, though no refusal conversion of initially unwilling respondents was done. A CATI system provided randomization of survey forms. 53.2% of the sample (424 cases) was assigned to the first survey group (Form A) and 46.8% (373 cases) were assigned to the second group (Form B). Our analysis in this paper is confined to Form B respondents. The survey was in the field from October 2, 1991 until March 5, 1992, with the bulk of interviewing occurring from November through February.

Since part of our purpose was the development of new survey measures, we tested two alternative sets of uncertainty questions (Forms A and B) using randomly selected half samples. Each respondent was questioned about one of the U.S. Senators from their state, the senator being randomly assigned. Respondents in each half-sample were presented a series of questions concerning their preferences and their perceptions of the senator's positions on two policy issues (tax increases and abortion) and on the liberal-conservative ideological dimension using a seven-point scale format.[1]

After each seven-point placement of their own position, respondents were asked: "Are you very certain of where you stand on this, pretty certain, or not very certain?" Next, following the placement of the senator, we probed for uncertainty about that position, asking "How certain are you of (Senator's name) position on this? Very certain, pretty certain, or not very certain?" These options deliberately parallel the options for the

[1]The wording of our seven point scales is presented below. These were modified for Form A to encourage "range" responses. Since this does not figure in the current paper we present only the Form B wording. To measure the senator's perceived position the question was modified by prefixing "What about Senator *Senator's name* from your state? Where would you place *Senator's name* on this scale ...".

Taxes: Some people feel that the federal government should not raise taxes under any circumstances. Others feel that a tax increase is required to reduce the deficit and pay for needed programs. Where would you place yourself on a scale from one to seven, where 1 means you feel taxes should not be raised under any circumstances and 7 means you feel that a tax increase is required to reduce the deficit and pay for needed programs?

Abortion: Some people feel that abortions should be illegal. Others feel that there should be no restrictions on a woman's right to an abortion if she wants one. Where would you place yourself on a scale from one to seven, where 1 means you feel abortions should be illegal and 7 means you feel that there should be no restrictions on a woman's right to an abortion?

Liberal/Conservative: In politics, some people have very liberal political views while other people have very conservative political views. Where would you place yourself on a scale from one to seven, where 1 means you have very liberal political views and 7 means you have very conservative political views?

respondent's own position. Respondents were randomly assigned to one of the senators from their state to maximize variation in characteristics of the senators we used as perceptual objects.

The variation in the uncertainty question wording between Forms A and B compared a dichotomous response option with a three point ordinal scale in order to examine respondents' abilities to make finer distinctions about their level of uncertainty.[2]

8.2 LSSC 2

The LSSC 2 data come from a national survey focusing on perceptions of candidates for the U.S. Senate which we conducted in the fall of 1992. This survey was also conducted by professional interviewers at the University of Wisconsin Letters and Sciences Survey Center. Telephone interviews with 877 adults from the 48 contiguous states were conducted, during a period from September 9, 1992 until November 30, 1992. The sampling procedure was a rolling cross section, in which national probability samples were generated *daily*, yielding small daily samples of the national adult population.

In the survey we first presented respondents with questions asking them to rate the relevant political figures (senate incumbents not running for re-election, senate incumbent running for re-election, challengers, or open seat candidates, depending on the state). Then, we asked a series of questions regarding their own, and those of two senate incumbents or candidates, positions on the abortion issue and on the liberal-conservative continuum. The abortion question was placed first, and read: "Some people feel that abortions should be illegal. Others feel that there should be no restrictions on a woman's right to an abortion if she wants one. Where would you place yourself on a scale from one to seven, where 1 means you feel abortions should be illegal and 7 means you feel that there should be no restrictions on a woman's right to an abortion?" Those respondents who placed themselves were asked a following question about the certainty of their placement: "Are you very certain of where you stand on this, pretty certain, or not very certain?"

Next, they were prompted for the position of the first political figure with the lead:

[2]Another question wording variant which we do not discuss in this paper concerned the wording of the seven-point scales. Form A respondents were read an introduction to the seven-point scale question designed to reveal the uncertainty in their perceptions, called "range formats", which are nearly identical to those employed in the 1980 National Election Study's Pilot Study. This question format was used in Form A for both the respondent's own position on each issue, as well as their perception of the senator's position. These invite the respondent to place themselves or the senator within some range, rather than at a single point, if they feel uncertain about the exact position. Form B respondents were read introductions to the seven-point scale questions very similar to that encountered in the usual NES survey, not utilizing the "range formats." Unfortunately, the results of the range format were disappointing. Only 6.0% of respondents gave a range response for their own position on the tax increase issue, 4.8% on the abortion scale, and 6.9% on the liberal-conservative dimension. This compares to a 1.3% rate of *unsolicited* range placement in Form B on both the tax and abortion scales, and 2.6% on the liberal-conservative scale.

"What about *Senator or candidate name* from your state?" If the respondent *did not* place the political figure, they were asked the following question: "If you had to guess, where would you guess *Name* would be on this scale?" Respondents who did not place the political figure following this question were branched to the placement of the next political figure on the abortion issue. Those who placed the political figure on either the first or second prompt were then asked the three questions we developed in our earlier analysis (Alvarez and Franklin 1994). First, they were asked about their *certainty* of the figure's placement: "How certain are you of *Name's* position on this? Very certain, pretty certain, or not very certain?" Second, we ascertained how much they had *heard* of the figure's position: "How much have you heard about *Name's* position on this? A lot, some, very little or nothing?" Last, they were asked about the *clarity* of the figure's position: "How clear has *Name* been about (his/her) position on this? Has (he/she) been very clear, pretty clear, or not very clear?" Respondents who were asked these questions were posed an identical set for the other political figure in the state.

The ideological placement questions followed the abortion questions, and the initial lead question was: "In politics, some people have very liberal political views while other people have very conservative political views. Where would you place yourself on a scale from one to seven, where 1 means you have very liberal political views and 7 means you have very conservative political views?" The structure and wording of the questions following this lead was identical to the abortion items.

In states with a Senate contest, we asked respondents about both candidates in the race. In states which did not have a Senate election, we instead asked about each incumbent Senator from the state.[3] In the pre-election sample there are 446 respondents in states with Senate elections and 199 in states without. These respondents form the core of our analysis.

8.3 1993 NES Pilot Study

The 1993 NES Pilot Study was a telephone re-interview of (cross-section) respondents to the 1992 NES Pre- and Post-Election Study. Interviews were taken by the Institute for Social Research, during September 23 – November 24, 1993. 750 respondents completed the re-interview.

The core of our use of the Pilot Study comes from a series of questions well into the body of the survey. Respondents were asked to place themselves on the usual seven-point ideology scale and then whether the interviewer got the placement correct. They were then asked the following uncertainty probe: "Are you very certain of where you stand on this, pretty certain, or not very certain?" They then were asked the seven-point ideology scale and the uncertainty probe for Clinton, Perot, and their house incumbent

[3]Because Louisiana decided its Senatorial race in the primary we asked about both incumbent Senators rather than about the primary challenger to Senator Breaux.

representative.[4]

[4]The analysis of these questions is complicated by a question-order experiment in the Pilot Study. To determine if projection-persuasion effects are influenced by the order in which respondents are asked to place themselves and the candidates, respondents were randomly given two different orderings of the seven-point placements of themselves and Clinton. One group was asked the questions in the typical order (self-placement and then Clinton placement) while the other group was asked in the reverse order (Clinton placement and then self-placement). The results we report in the paper are not sensitive to the question ordering.

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Figure 1: Uncertainty and Scale Placement

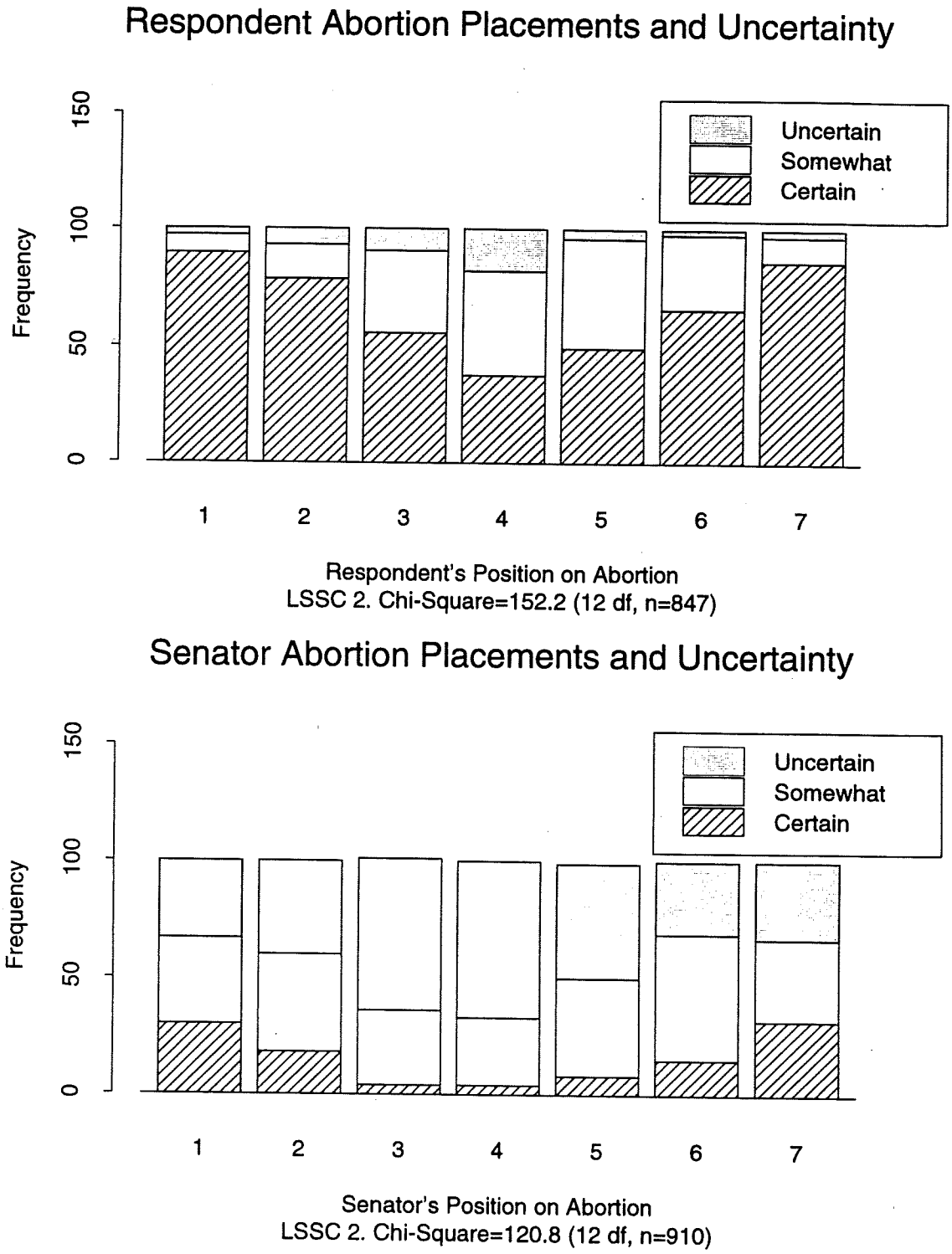
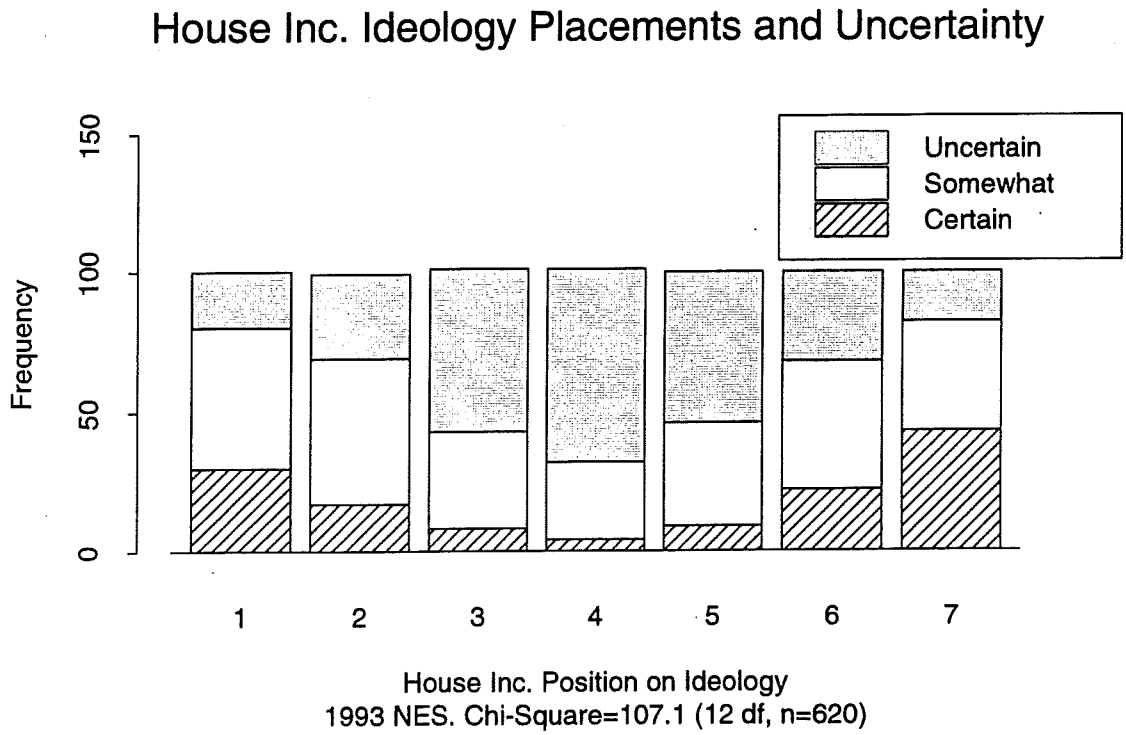


Figure 2: Uncertainty and Scale Placement



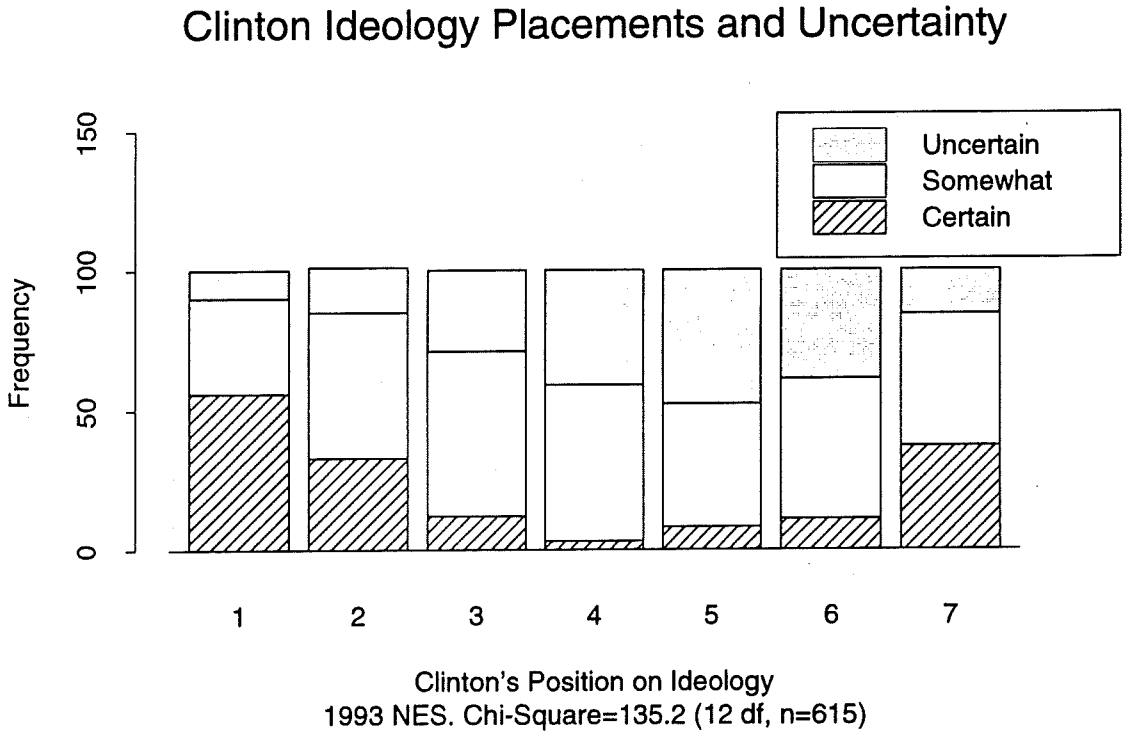


Table 1: Seven-point scale Ideology placements and uncertainty: Response Marginals

	Percent Giving Position on Seven-point scale						
Uncertainty Resp	1	2	3	4	5	6	7
LSSC 1 Senator							
Certain	56	40	10	8	13	12	45
Pretty Certain	28	40	62	53	58	56	39
Uncertain	17	20	28	39	29	32	16
Column n	18	15	29	49	48	25	31
LSSC 1 Resp.							
Certain	67	50	22	53	62	57	72
Pretty Certain	25	50	70	39	36	36	20
Uncertain	8	0	9	8	2	7	8
Column n	24	10	23	38	45	14	25
LSSC 2 Senator							
Certain	40	23	10	8	11	16	36
Pretty Certain	41	64	49	39	54	55	45
Uncertain	19	13	41	53	35	29	19
Column n	139	114	195	216	266	177	179
LSSC 2 Resp.							
Certain	59	75	43	48	46	56	65
Pretty Certain	31	23	51	48	47	39	27
Uncertain	9	2	6	5	7	5	8
Column n	74	44	116	166	188	100	148
NES House Rep.							
Certain	30	17	8	4	9	22	43
Pretty Certain	50	52	35	28	37	46	39
Uncertain	20	30	58	69	54	32	18
Column n	20	46	106	170	134	95	49
NES Clinton							
Certain	56	33	12	3	8	11	37
Pretty Certain	34	52	59	56	44	50	47
Uncertain	10	16	29	41	48	39	16
Column n	102	129	164	88	75	38	19
NES Perot							
Certain	26	15	9	10	7	20	36
Pretty Certain	44	26	52	32	48	56	41
Uncertain	30	59	39	58	44	24	23
Column n	43	46	66	120	162	151	95
NES Resp.							
Certain	47	50	43	30	46	69	68
Pretty Certain	53	45	43	52	45	27	27
Uncertain	0	5	13	19	9	4	5
Column n	17	56	90	91	143	102	41

Table 2: Seven-point scale Abortion placements and uncertainty: Response Marginals

	Percent Giving Position on Seven-point scale						
Uncertainty Resp.	1	2	3	4	5	6	7
LSSC 1 Senator							
Certain	26	25	5	14	0	23	47
Pretty Certain	52	50	20	24	40	46	19
Uncertain	23	25	75	62	60	31	34
Column n	31	16	20	29	20	13	32
LSSC 1 Resp.							
Certain	89	80	62	68	59	80	87
Pretty Certain	11	20	38	32	29	20	13
Uncertain	0	0	0	0	12	0	0
Column n	27	15	13	22	17	10	78
LSSC 2 Senator							
Certain	30	18	4	4	8	15	32
Pretty Certain	37	42	32	29	42	54	35
Uncertain	33	40	65	67	49	31	33
Column n	159	57	110	112	144	111	217
LSSC 2 Resp.							
Certain	89	79	56	38	49	66	86
Pretty Certain	8	14	35	44	46	32	12
Uncertain	3	7	10	18	4	2	3
Column n	142	42	52	61	95	88	367

Table 3: Seven-point scale Taxes placements and uncertainty: Response Marginals

Uncertainty Resp.	Percent Giving Position on Seven-point scale						
	1	2	3	4	5	6	7
LSSC 1 Senator							
Certain	23	9	9	5	5	11	30
Pretty Certain	33	64	23	30	40	61	39
Uncertain	43	27	69	65	55	28	30
Column n	30	11	35	37	40	18	23
LSSC 1 Resp.							
Certain	62	59	23	22	18	31	55
Pretty Certain	33	35	70	61	59	63	45
Uncertain	5	6	7	17	23	6	0
Column n	60	17	30	23	22	16	11

Table 4: Seven-point scale placements and uncertainty

		Taxes	Abortion	Ideology
LSSC 1 (2 choice)				
	Respondent	13.3*	13.5*	12.6*
	Senator	11.7	17.4*	13.1*
LSSC 1 (3 choice)				
	Respondent	32.4*	29.9*	19.2
	Senator	29.4*	39.7*	38.4*
LSSC 2				
	Respondent		152.2*	40.0*
	Senator		120.8*	170.2*
ANES Pilot				
	Respondent			45.7*
	House Rep.			107.1*
	Clinton			135.2*
	Perot			85.6*

Note: Entries are χ^2 statistics. * denotes statistics significant at the p=0.05 level.

Table 5: Seven-point scale placements and uncertainty: Controls for Education and Information

		Taxes	Abortion	Ideology
LSSC 1 (2 choice)				
	Respondent	13.0*	15.8*	15.9*
	Senator	11.6	15.9*	15.1*
LSSC 1 (3 choice)				
	Respondent	31.9*	33.1*	19.0
	Senator	33.2*	46.5*	42.5*
LSSC 2				
	Respondent		78.8*	25.5*
	Senator		117.8*	179.1*
ANES Pilot				
	Respondent			46.2*
	House Rep.			106.7*
	Clinton			130.9*
	Perot			85.0*

Note: Entries are Cochran-Mantel-Haenszel general association statistics for the relationship between placement and uncertainty on a particular scale, controlling simultaneously for education and political information. These statistics can be interpreted as χ^2 statistics adjusted for the influences of education and information. * denotes statistics significant at the p=0.05 level.

Table 6: Seven-point scale placements and uncertainty: Other controls

	Controls for education, information, and:		
	Political Interest	Media Attention Political Interest	Attitude Importance Media Attention Political Interest
Respondent	47.7*	45.1*	39.7*
House Rep.	103.4*	89.6*	93.4*
Clinton	122.7*	116.3*	110.9*
Perot	89.2*	75.1*	75.4*

Note: Entries are Cochran-Mantel-Haenszel general association statistics for the relationship between placement and uncertainty on a particular scale, controlling simultaneously for education, political information and a set of other control variables (political interest, media attention, and attitude importance. These statistics can be interpreted as χ^2 statistics adjusted for the influences of the relevant control variables. * denotes statistics significant at the p=0.05 level.

Table 7: Temporal Stability of Ideological Placements, 1992-93

	Total Sample	Very Certain	Pretty Certain	Not Very Certain
Respondent	.590	.613	.512	.381
Clinton	.359	.520	.288	.147
Perot	.208	.326	.237	.088

Note: Entries are Kendall τ-b Correlation Coefficients.

Table 8: Temporal Stability of Ideological Placements with Controls, 1992-93

Controlling for Political Information

	Very Certain	Pretty Certain	Not Very Certain
Respondent	.612	.514	.378
Clinton	.524	.264	.127
Perot	.314	.241	.077

Controlling for Education

	Very Certain	Pretty Certain	Not Very Certain
Respondent	.610	.519	.404
Clinton	.520	.289	.133
Perot	.335	.233	.087

Controlling for Political Interest

	Very Certain	Pretty Certain	Not Very Certain
Respondent	.609	.510	.390
Clinton	.515	.282	.143
Perot	.349	.237	.118

Controlling for Media Attention

	Very Certain	Pretty Certain	Not Very Certain
Respondent	.629	.511	.365
Clinton	.494	.272	.144
Perot	.312	.216	.089

Controlling for Attitude Importance

	Very Certain	Pretty Certain	Not Very Certain
Respondent	.613	.511	.346
Clinton	.526	.282	.143
Perot	.303	.244	.084

Note: Entries are Kendall Partial τ-b Correlation Coefficients.